EXHIBIT 5

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Tomadol

TOMAH[3]
PRODUCTS, INC.

# Tomadol™

## Alcohol Ethoxylate Product Guide

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## Human Safety of Tomadol® Alcohol Ethoxylates

**Tomadol** alcohol ethoxylates have been used safely for many years in consumer products and other industrial applications. These materials have low to moderate acute oral and dermal toxicity. Their irritancy potential is similar to materials derived from coconut alcohols.

Like other nonionic surfactants, **Tomadol** alcohol ethoxylates are moderate to severe eye and skin irritants. Dilutions of these ethoxylates are significantly milder: 1% and 10% concentrations are generally mild to moderate skin irritants. The **Tomadol** alcohol ethoxylates have not been found to cause allergic skin reactions.

## Biodegradability

Many properties of surfactants that are useful in the applications such as industrial cleaning can have undesirable effects on the environment. For example, surfactants frequently migrate to solid/liquid or liquid/air interfaces and exhibit foaming characteristics when they function as cleaning agents. These properties cause toxicity to aquatic life and unsightly foam, which also tends to minimize good oxygen transport from the air to lakes, streams, and other receiving waters.

The U.S. Clean Water Act regulates discharge of surfactants and other chemicals to receiving waters by requiring permits to dischargers. They must show that the contents of the discharge do not foam or cause harm to aquatic life. These discharges, whether they originate from household or industrial and institutional waste, must be treated prior to entry into public waters. The heart of waste treatment today is an aerobic microbial process which converts organic materials like surfactants to products which are not deleterious to the environment.

What separates environmentally acceptable surfactants from those that are environmentally unacceptable is the capability of that surfactant to biodegrade during its residence time in the waste treatment process. The Environmental Protection Agency (EPA) has published a number of laboratory-based guideline tests to screen chemicals for their biodegradability (40 CFR, Parts 796-3100 to 796-3360, 7-1-91 edition). Alcohol sulfates, ethoxysulfates and ethoxylates based on **Tomadol** alcohols have been shown to be *readily biodegradable* when subjected to these tests. A product which is *readily biodegradable* falls into the most biodegradable classification as defined by EPA. Figure 32 shows the results of the Closed Bottle BOD Test — one of the EPA guideline tests — on **Tomadol 25-9** ethoxylate. For comparison, $C_{13}$ AE-7, a highly branched alcohol ethoxylate, and NPE-9, a highly branched alkylphenol ethoxylate, are also included. As shown, the highly branched nonionics biodegrade more slowly and less extensively than **Tomadol 25-9** ethoxylate, which is an essentially linear alcohol ethoxylate.



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**Figure 32. Biodegradation of Tomadol™ 25-9 and Two Highly Branched Nonionics in Closed Bottle BOD Test**

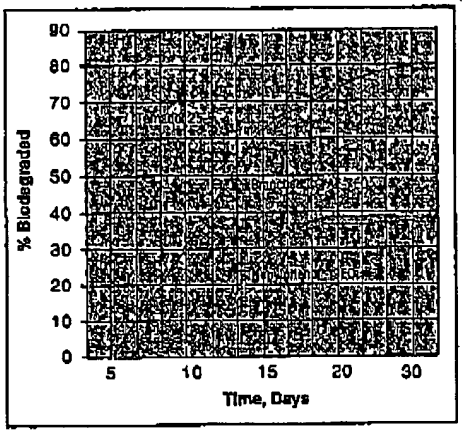
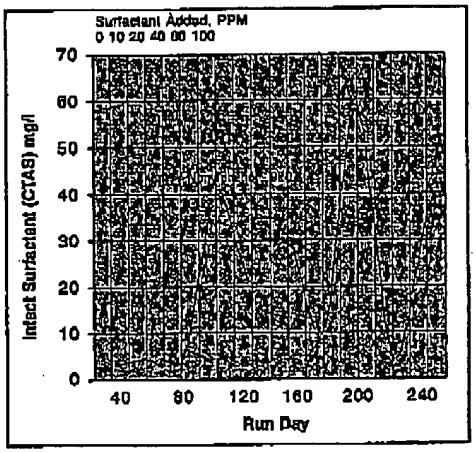



**Figure 33. Measurement of Intact Surfactant in Biotreater Effluents Under Industrial Use Conditions**






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Results of biodegradability tests based on closed bottle oxygen uptake data are listed in Table 16. These results show 62-96% biodegradation for **Tomadol** alcohol ethoxylates as measured by a 30-day BOD test. In contrast, a nonylphenol ethoxylate showed only 30% biodegradation by this test method.

In addition to the EPA guideline tests, **Tomadol** alcohol ethoxylates have been studied in radiolabeled biodegradation tests in laboratory tests simulating full scale sewage treatment in summer and winter conditions under industrial waste treatment plant conditions and in full scale sewage treatment. The results show **Tomadol** alcohol ethoxylate surfactants biodegrade rapidly and extensively under a variety of normal and stressed conditions to non-foaming, non-toxic products which do not present a problem in obtaining discharge permits for waste treatment plant effluents.

## Aquatic Safety and Industrial Effluents

Surfactants are used in processing by such industries as agriculture, textiles, pulp and paper, and institutional laundry. These industries use surfactants at much higher concentrations than are used in household applications. The spent process streams entering receiving waters from these industries are increasingly undergoing close scrutiny by regulatory agencies. Rules have been promulgated that require non-foaming effluents which are non-toxic to aquatic life. Surfactants that are not fully biodegraded exhibit appreciable foaming and aquatic toxicity behavior. In order to meet the requirements of state and federal environmental agencies, surfactants which biodegrade rapidly must be selected.

In previous biodegradation studies, **Tomadol** alcohol ethoxylates and nonylphenol ethoxylates were compared under industrial use conditions. The results (Figure 33) show that considerably higher levels of nonylphenol ethoxylate remained than **Tomadol 25-7** ethoxylate after biotreatment. Since much of the nonylphenol ethoxylate remained intact after biotreatment, its effluent was highly foaming and toxic (Table 17) to two aquatic species tested, Daphnia pulex (waterbug) and Pimephales promelas (fathead minnow). In contrast, **Tomadol 25-7** ethoxylate biodegraded to non-foaming, non-toxic products even at the relatively high, but realistic, concentration levels tested.

Since all surfactants are toxic to aquatic life, their capability to biodegrade to non-toxic products under realistic biotreatment conditions is an important part of the considerations of their environmental impact. **Tomadol** alcohol ethoxylates, as well as sulfate and ethoxysulfate derivatives of **Tomadol** alcohol ethoxylates biodegrade rapidly and extensively to non-toxic, non-foaming products even under such stress conditions as high loadings and low temperature.

## Conformance with Federal Regulations

**Tomadol** alcohol ethoxylates are acceptable for use in compliance with FDA applications as indirect food additives and cosmetics under 21 CFR 176.170 and 176.180.

In some cases, these products are also approved for use as inert ingredients in pesticide formulations.



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# Table 18. Suggested Product End-Uses for Tomadol™ Ethoxylates

| | Household Products | | | | | | | | Personal Care Products | | | | Industrial & Institutional Cleaners | | | | | | | | Industrial Process & Formulation Aids | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOMADOL™ Alcohol Ethoxylates (Nonionic Surfactants) 100% Active | All Purpose Cleaner | Multifunctional Laundry Products | Hand Dishwash Liquid | Prespotters | Hand Laundry Liquids | Laundry Liquids | Laundry Powders (Blend) | Laundry Powders (Spary Dried) | Emollient | Perfume Solubilizer | Shampoo, Bubble Bath | Toilet Soap | Hard Surface Cleaners | Car, Truck, Ship, Airplane | Floor, Wall, Tile | High Foam Car Wash | Laundry Liquids | Laundry Powders | Metal Soak Cleaners | Rug Cleaners | Solvent Cleaners | Foaming Control | Leather Processing | Metal Rolling Oils | Mining Dedust | Oil Field Chemicals | Paints | Pesticide Adjuvants | Textile Applications |
| 91-2.5 | ● | x | | ● | | | | | | | | | ● | ● | ● | | | | ● | | ● | x | ● | | | ● | | | |
| 91-6 | ● | ● | | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● |
| 91-8 | ● | | | | | | | | | | | | ● | ● | ● | ● | | ● | ● | | ● | | ● | | | ● | ● | ● | ● |
| 1-3 | ● | x | | ● | | | | | | | | | ● | ● | ● | | | | ● | | ● | x | ● | ● | | ● | | | |
| 1-5 | ● | ● | | ● | ● | ● | ● | | | | | | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | | ● | ● | ● | ● |
| 1-7 | ● | ● | | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | ● | ● | ● | ● |
| 1-9 | ● | | ● | | | | | | | ● | | | ● | ● | ● | ● | | ● | ● | | ● | | ● | | | ● | ● | ● | ● |
| 23-1 | | | x | ● | | | | | | | x | x | | | | | | | | | | x | | ● | | | | | ● |
| 23-3 | | x | x | ● | | | ● | | | | | | ● | | | | | | | | ● | | | ● | | ● | | | ● |
| 23-5 | ● | ● | | ● | | ● | ● | | | | | | ● | ● | ● | | ● | ● | ● | | ● | | ● | | | ● | | ● | ● |
| 23-6.5 | ● | ● | | ● | ● | ● | ● | | | | | | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | | | ● | ● | ● | ● |
| 25-3 | x | x | | ● | | | | | | | x | | | | | | ● | ● | | x | ● | | | | | | | | |
| 25-7 | ● | ● | | ● | ● | ● | ● | | | | | | | | ● | | ● | ● | ● | ● | | | | ● | | ● | | | ● |
| 25-9 | ● | ● | | | ● | ● | ● | | | | | | ● | | ● | | ● | ● | ● | ● | | | | | | | ● | ● | ● |
| 25-12 | ● | ● | | | ● | ● | | ● | | ● | | | | | | | ● | ● | | ● | | | | | | | ● | ● | ● |
| 45-2.25 | | | x | ● | | | | | | | | | | | | | | | | | ● | x | | ● | | ● | | | ● |
| 45-7 | | ● | | ● | | | ● | ● | | | | | | | | | | ● | | | | | | | | | | | ● |
| 45-13 | | | | | | | | ● | | | | | | | | | | ● | | ● | | | | | | | | | |

● = Tomadol Product Used Directly

X = Tomadol Product Used as Raw Material for End-Use Product



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